

REMARKS

In the Office Action, the Examiner rejected claims 1-7, 9 and 10 under 35 U.S.C § 103 as being unpatentable over United States Patent 4,890,066 issued to Straver et al. ("Straver") in view of United States Patent 6,556,535 issued to Kobayashi ("Kobayashi"). In addition, the Examiner rejected claims 8 and 11 under 35 U.S.C. § 103 as being unpatentable over Straver in view of Kobayashi, and further in view of United States Patent 4,809,554 issued to Shade et al. ("Shade"). Applicants have not amended, added or canceled any claim. Accordingly, claims 1-11 are pending in the application.

I. Rejection of Claims 1-3 Under § 103

In the Office Action, the Examiner rejected claims 1-3 under §103(a) as being unpatentable over Straver in view of Kobayashi. Claims 2 and 3 are dependent directly or indirectly on independent claim 1. Claim 1 recites an envelope detector for determining whether the level of a differential input signal $DPIN - DNIN$ is above a reference voltage V_{REF} . The envelope detector includes means that converts the differential input signal to a differential current $IDP - IDN$ and the reference voltage to a reference current I_{REF} . The envelope detector also includes means that compares the currents to determine if $|IDP - IDN|$ is greater than I_{REF} . The envelope detector further includes means that indicates a valid differential signal when $|IDP - IDN|$ is greater than I_{REF} .

Applicants respectfully submit that the cited references, neither separately nor through their hindsight combination, disclose, teach, or even suggest such an envelope detector. First, Straver does not disclose a differential input signal $DPIN - DNIN$, as recited in claim 1. Instead, Straver describes a single input voltage V_i that is applied to a signal input of a differential amplifier A. See Straver, column 3, lines 11-12 and 8-9. Straver's single input voltage V_i is not a

differential input signal $DPIN - DNIN$. The value of the differential input signal $DPIN - DNIN$ is the difference between the individual values of the input signal $DPIN$ and the input signal $DNIN$. Straver's single input signal does not represent such a value and therefore cannot be the differential input signal $DPIN - DNIN$, as recited in claim 1. Second, since Straver does not describe a differential input signal, Straver does not disclose converting the differential input signal into a differential current $IDP - IDN$.

Third, Straver does not disclose a reference voltage, as recited in claim 1. The Examiner points to Fig. 2 of Straver as disclosing a reference voltage ($+V_B$). However, Straver's voltage ($+V_B$) is not a reference voltage. Instead, the voltage ($+V_B$) is a power supply voltage that drives the currents $I1$ and $I2$. See Straver, column 3, lines 30-33. Fourth, since Straver does not describe a reference voltage, Straver does not disclose converting the reference voltage into a reference current.

Fifth, Straver does not describe comparing the currents to determine if $|IDP - IDN|$ is greater than the reference current, as recited in claim 1. The Examiner states that it would have been obvious to incorporate Kobayashi's comparator to make such a determination. However, since Straver does not describe a reference current, there is no purpose in combining Kobayashi and Straver. Moreover, claim 1 recites comparing to a reference current. As described above, Straver, Kobayashi, and their hindsight combination, do not disclose, teach, or even suggest such a limitation.

Accordingly, Applicants respectfully submit that the cited references do not render claim 1 unpatentable. As claims 2 and 3 are dependent directly or indirectly on claim 1, Applicants respectfully submit that claims 2 and 3 are patentable over the cited references for at least the same reasons that were discussed above for claim 1.

In view of the foregoing, Applicants respectfully request reconsideration and withdrawal of the § 103(a) rejection of claims 1-3.

II. Rejection of Claims 4 and 5 Under § 103

In the Office Action, the Examiner rejected claims 4 and 5 under § 103(a) as being unpatentable over Straver in view of Kobayashi. Claim 5 is dependent directly on independent claim 4. Claim 4 recites a method of determining whether the level of a differential input signal $DPIN - DNIN$ is above a reference voltage V_{REF} . The method converts the differential input signal to a differential current $IDP - IDN$. The method converts the reference voltage to a reference current I_{REF} . The method also compares the currents to determine if $|IDP - IDN|$ is greater than I_{REF} . The method further indicates a valid differential signal when $|IDP - IDN|$ is greater than I_{REF} .

Applicants respectfully submit that the cited references, neither separately nor through their hindsight combination, disclose, teach, or even suggest such an envelope detector. First, as mentioned above, Straver does not disclose a differential input signal $DPIN - DNIN$, as recited in claim 4. Instead, Straver describes a single input voltage V_i that is applied to a signal input of a differential amplifier A. See Straver, column 3, lines 11-12 and 8-9. Straver's single input voltage V_i is not a differential input signal $DPIN - DNIN$. The value of the differential input signal $DPIN - DNIN$ is the difference between the individual values of the input signal $DPIN$ and the input signal $DNIN$. Straver's single input signal does not represent such a value and therefore cannot be the differential input signal $DPIN - DNIN$, as recited in claim 4. Second, since Straver does not describe a differential input signal, Straver does not disclose converting the differential input signal into a differential current $IDP - IDN$.

Third, Straver does not disclose a reference voltage, as recited in claim 4. The Examiner points to Fig. 2 of Straver as disclosing a reference voltage ($+V_B$). However, Straver's voltage

(+V_B) is not a reference voltage. Instead, the voltage (+V_B) is a power supply voltage that drives the currents I₁ and I₂. See Straver, column 3, lines 30-33. Fourth, since Straver does not describe a reference voltage, Straver does not disclose converting the reference voltage into a reference current.

Fifth, Straver does not describe comparing the currents to determine if $|IDP - IDN|$ is greater than the reference current, as recited in claim 4. The Examiner states that it would have been obvious to incorporate Kobayashi's comparator to make such a determination. However, since Straver does not describe a reference current, there is no purpose in combining Kobayashi and Straver. Moreover, claim 4 recites comparing to a reference current. As described above, Straver, Kobayashi, and their hindsight combination, do not disclose, teach, or even suggest such a limitation.

Accordingly, Applicants respectfully submit that the cited references do not render claim 4 unpatentable. As claim 5 is dependent directly on claim 4, Applicants respectfully submit that claim 5 is patentable over the cited references for at least the same reasons that were discussed above for claim 4.

In view of the foregoing, Applicants respectfully request reconsideration and withdrawal of the § 103(a) rejection of claims 4 and 5.

III. Rejection of Claims 6-8 Under § 103

In the Office Action, the Examiner rejected claims 6 and 7 under § 103(a) as being unpatentable over Straver in view of Kobayashi. Additionally, the Examiner rejected claim 8 under § 103(a) as being unpatentable over the combination of Straver, Kobayashi, and Shade. Claims 7 and 8 are dependent directly or indirectly to claim 6. Claim 6 recites an envelope detector for determining whether the level of a differential input signal DPIN - DNIN is above a reference voltage V_{REF}. The differential input signal being cyclical with DPIN and DNIN each

being greater than the other during alternate cycles and crossing over during a switching interval between the cycles. The envelope detector includes means that converts the differential input signal to a differential current $IDP - IDN$ and the reference voltage to a reference current I_{REF} . The envelope detector also includes means for comparing the currents and providing an output signal indicative of a valid differential signal when $|IDP - IDN|$ is greater than I_{REF} . The envelope detector further includes means for maintaining the output signal during the switching interval following a cycle in which $|IDP - IDN|$ is greater than I_{REF} .

Applicants respectfully submit that the cited references, neither separately nor through their hindsight combination, disclose, teach, or even suggest such an envelope detector. First, as previously mentioned, Straver does not disclose a differential input signal $DPIN - DNIN$, as recited in claim 6. Instead, Straver describes a single input voltage V_i that is applied to a signal input of a differential amplifier A. See Straver, column 3, lines 11-12 and 8-9. Straver's single input voltage V_i is not a differential input signal $DPIN - DNIN$. The value of the differential input signal $DPIN - DNIN$ is the difference between the individual values of the input signal $DPIN$ and the input signal $DNIN$. Straver's single input signal does not represent such a value and therefore cannot be the differential input signal $DPIN - DNIN$, as recited in claim 6. Second, since Straver does not describe a differential input signal, Straver does not disclose converting the differential input signal into a differential current $IDP - IDN$.

Third, Straver does not disclose a reference voltage, as recited in claim 6. The Examiner points to Fig. 2 of Straver as disclosing a reference voltage $(+V_B)$. However, Straver's voltage $(+V_B)$ is not a reference voltage. Instead, the voltage $(+V_B)$ is a power supply voltage that drives the currents $I1$ and $I2$. See Straver, column 3, lines 30-33. Fourth, since Straver does not describe a reference voltage, Straver does not disclose converting the reference voltage into a reference current.

Fifth, Straver does not describe comparing the currents to determine if $|IDP - IDN|$ is greater than the reference current, as recited in claim 6. The Examiner states that it would have been obvious to incorporate Kobayashi's comparator to make such a determination. However, since Straver does not describe a reference current, there is no purpose in combining Kobayashi and Straver. Moreover, claim 6 recites comparing to a reference current. As described above, Straver, Kobayashi, and their hindsight combination, do not disclose, teach, or even suggest such a limitation.

Accordingly, Applicants respectfully submit that the cited references do not render claim 6 unpatentable. As claims 7 and 8 are dependent on claim 6, Applicants respectfully submit that claims 7 and 8 are patentable over the cited references for at least the same reasons that were discussed above for claim 6. In view of the foregoing, Applicants respectfully request reconsideration and withdrawal of the § 103(a) rejection of claims 6-8.

IV. Rejection of Claims 9-11 Under § 103

In the Office Action, the Examiner rejected claims 9 and 10 under § 103(a) as being unpatentable over Straver in view of Kobayashi. Additionally, the Examiner rejected claim 11 under § 103 as being unpatentable over the combination of Straver, Kobayashi, and Shade. Claims 10 and 11 are dependent directly on independent claim 9. Claim 9 recites a method for determining whether the level of a differential input signal $DPIN - DNIN$ is above a reference voltage V_{REF} . The differential input signal being cyclical with $DPIN$ and $DNIN$ each being greater than the other during alternate cycles and crossing over during a switching interval between the cycles. The method converts the differential input signal to a differential current $IDP - IDN$ and the reference voltage to a reference current I_{REF} . The method compares the differential current and the reference current. The method provides an output signal indicative of a valid

differential signal when $|IDP - IDN|$ is greater than I_{REF} . The method maintains the output signal during the switching interval following a cycle in which $|IDP - IDN|$ is greater than I_{REF} .

Applicants respectfully submit that the cited references, neither separately nor through their hindsight combination, disclose, teach, or even suggest such an envelope detector. First, as mentioned above, Straver does not disclose a differential input signal $DPIN - DNIN$, as recited in claim 9. Instead, Straver describes a single input voltage V_i that is applied to a signal input of a differential amplifier A. See Straver, column 3, lines 11-12 and 8-9. Straver's single input voltage V_i is not a differential input signal $DPIN - DNIN$. The value of the differential input signal $DPIN - DNIN$ is the difference between the individual values of the input signal $DPIN$ and the input signal $DNIN$. Straver's single input signal does not represent such a value and therefore cannot be the differential input signal $DPIN - DNIN$, as recited in claim 9. Second, since Straver does not describe a differential input signal, Straver does not disclose converting the differential input signal into a differential current $IDP - IDN$.

Third, Straver does not disclose a reference voltage, as recited in claim 9. The Examiner points to Fig. 2 of Straver as disclosing a reference voltage ($+V_B$). However, Straver's voltage ($+V_B$) is not a reference voltage. Instead, the voltage ($+V_B$) is a power supply voltage that drives the currents $I1$ and $I2$. See Straver, column 3, lines 30-33. Fourth, since Straver does not describe a reference voltage, Straver does not disclose converting the reference voltage into a reference current.

Fifth, Straver does not describe comparing the differential current and the reference current, as recited in claim 9. The Examiner states that it would have been obvious to incorporate Kobayashi's comparator to make such a determination. However, since Straver does not describe a reference current, there is no purpose in combining Kobayashi and Straver. Moreover, claim 9

recites comparing to a reference current. As described above, Straver, Kobayashi, and their hindsight combination, do not disclose, teach, or even suggest such a limitation.

Accordingly, Applicants respectfully submit that the cited references do not render claim 9 unpatentable. As claims 10 and 11 are dependent directly on claim 9, Applicants respectfully submit that claims 10 and 11 are patentable over the cited references for at least the same reasons that were discussed above for claim 9. In view of the foregoing, Applicants respectfully request reconsideration and withdrawal of the § 103(a) rejection of claims 9-11.


CONCLUSION

In view of the foregoing, it is submitted that all pending claims, namely claims 1-11, are in condition for allowance. Reconsideration of the rejections is requested. Allowance is earnestly solicited at the earliest possible date.

Respectfully submitted,

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